



One of the important goals of the Dutch WASH Alliance is providing clean water and keeping it clean in order to prevent diseases. What is the most effective way to achieve that goal in an ecologically sustainable manner? This factsheet contains a number of suggestions and practical examples. Projects can focus on preventing sewage from coming into contact with drinking water, but they can also focus on re-using nutrients from that same sewage.

Most of the fresh water on earth falls as rain from the sky, is stored deep underground or comes to the surface as streams, springs and rivers. Often, that water is of good quality but gets polluted later on. This especially happens in places where population pressure is high, water uses vary and waste flows come into contact with the water. In such cases, purification is needed before people can drink that water. Basically, wherever there is human activity, there is usually pollution. Detergents, artificial fertiliser and industrial waste often find their way to natural sources of drinking water, as does sewage. People often do not see the consequences this contamination can have for their health and living environment, nor do they realise the damage it can cause to the ecosystems that they rely upon. It also dramatically increases the risk of diarrhoea, typhoid fever and cholera. In many places around the globe, this pollution of the natural environment has fatal consequences.

## The power of nature

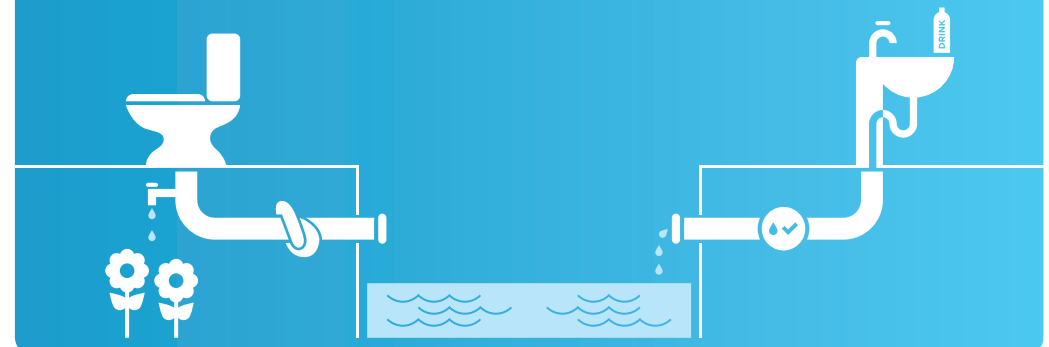
Nature is often capable of breaking down the hazardous materials that contaminate water or soil on its own. But if the water or soil have too many of these substances, then natural processes are unable to deal with them. It is therefore essential that contamination is limited; either by simply using less hazardous substances, by recycling sewage for use as fertiliser or by replacing chemical substances with natural alternatives. There are also ecologically sustainable methods for preventing drinking water from coming into contact with the inevitable waste substances and sewage.

The other side of this fact sheet presents a few suggestions on how to deal with waste and sewage contamination in water and soil. The concrete implementation of these suggestions will differ from place to place, as each location has its own specific ecological characteristics that should be taken into consideration. The local community's needs and abilities should also play a vital role, just as the extend to which they rely on the resources and services provided by their surrounding natural environment.

### The Dutch WASH Alliance

...is active in the fields of Water, Sanitation and Hygiene (WASH), especially in developing countries and always in partnership with local parties: from local community and governments to businesses and civil society organisations. The solutions vary from context-specific awareness creation programmes and training courses to the construction of water systems or sanitary facilities. The work is always focused on achieving sustainable results. In order to realise these goals, the organisation follows the 'FIETS' strategy. 'FIETS' is not only the Dutch word for 'bicycle' (itself a very sustainable way to move!), it also stands for Financial, Institutional, Environmental, Technical and Social sustainability of WASH interventions.

### Reutilisation of nutrients from waste flows and prevention of water contamination



## 1 Purify contaminated water sources

Nature is often able to remove contaminants from water on its own. Take fertilisers for example; they can be converted or purified in natural systems, such as wetlands. Stands of reeds remove many waste products from the water that flows through them. But sometimes nature needs a helping hand in the form of artificial filters placed in the water flow.

*What do the wetlands in East Kolkata in India and the Nativubo swamp in Uganda have in common? Simple: they both collect the waste water that flows from urban areas, and they purify the water so well that the water can be used for agricultural purposes in the areas. Egypt is also familiar with the purifying effect of wetlands; people there have even created an artificial wetland to purify the contaminated water from Cairo before it flows back into the Nile delta.*

## 2 Reutilisation of nutrients from sewage and waste

The organic material in sewage and waste consists of a number of substances. Some of them are harmful, but others are beneficial for the growth of agricultural crops. There are a number of methods for obtaining the beneficial nutrients from sewage and waste, such as drying the organic material (dehydration), giving it a special vacuum treatment (digestion) or exposing it to microorganisms (composting). Composting is often combined with dehydration or digestion.

*In the Nagyubuyuban region of the Philippines, people collect urine from the toilets of two schools and a public toilet in an enormous tank. The good nutrients from the urine are used to fertilise the local rice fields, crops, orchards and flower gardens. This prevents the harmful substances in the urine from entering the environment, which is good news for the local flora and fauna. Just as the fact that artificial fertilisers are no longer needed to increase the harvest of the crops in the area. This not only reduces pollution, but also saves money.*

## 3 Prevent sewage and waste from entering water sources

The environmental damage and diseases that are spread through water are often the result of waste or sewage coming into contact with sources of drinking water. People are often unaware of how important it is to limit this contact, so it is vital that they receive information about water, sanitation and hygiene. Sources of water must also be protected from waste and sewage, so that the sewage can be used for agricultural purposes. Special sanitation technologies make it possible to separate and recycle sewage and waste for beneficial purposes.

*People often have to be encouraged to use these technologies. In the Indian region of Tamil Nadu, this encouragement was provided in the form of a small amount of money when people visited the newly installed public toilets. The money was provided from the profits from the sale of the urine to local banana farmers. These toilets were special 'ecosan' toilets that separate faeces from urine and neutralise the harmful substances and store the beneficial substances.*

### Preparation of projects

Here are a few suggestions for starting a project for purifying water sources:

- Determine the smallest catchment or watershed affected by the project.
- Find out how communities in upstream areas are connected to those in downstream areas.
- Find out how and where the nature can be used to purify water and process waste.
- Find out how much contamination the local nature can handle on its own.
- Research which measures the local population want and can implement themselves.

